McDermitt Complex, Restoration/Rehabilitation and Noxious Weed Control Project
Environmental Assessment, OR-030-99-009

BLM OFFICE: Jordan Field Office

PROPOSED ACTION: Integrated prescribed burning, noxious weed control, and seeding treatment on multiple units in the southern portion of the Jordan Resource Area, between Blue Mountain pass and McDermitt, Nevada.

LOCATION OF PROPOSED ACTION: Locations are identified on map 1, and in whole or part of the following administrative units:

Etchart Sdg.	T.39 S., R.41 E., sec(s). 11,12,13,14.
McDermitt Sdg.(W)	T.39 S., R.42 E., sec(s). 5,6,7,8,17,18,19,20,29,30,31,32.
	T.40 S., R.42 E., sec(s). 5,6.
McDermitt Sdg. (E)	T.39 S., R.42 E., sec(s). 3,4,9,10,15,22,23,26,27,34.
Burro Sdg.	T.38 S., R.42 E., sec(s). 35.
	T.39 S., R.42 E., sec(s). 2,11,14,23.
High Peak Sdg	T.39 S., R.42 E., sec(s). 23,24,25,26,35,36.
High Peak Native	T.39 S., R.42 E., sec(s). 35,36.
	T.40 S., R.42 E., sec(s). 1,12.
	T.39 S., R.43 E., sec(s). 31.
	T.40 S., R.43 E., sec(s). 6,7.
Horse Pasture	T.40 S., R.43 E., sec(s). 21,28,29,32,33.
Andy Fife	T.40 S., R.43 E., sec(s). 22,27,34.
Lazy T	T.40 S., R.43 E., sec(s). 33.
	T.41 S., R.43 E., sec(s). 1,2,3,4,9.
Ten Mile Sdg.	T.41 S., R.43 E., sec(s). 4,5,6,7,8,9,17,18.
Wilkinson	T.41 S., R.43 E., sec(s). 9,10,11,12,16,17,18.
Flat Top Sdg	T.40 S., R 42 E., sec(s). 31,32.
	T.41 S., R 42 E., sec(s). 4,5,6,8,9
Lucky Seven	T.41 S., R 42 E., sec(s). 1,2,11,12,13.

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CONFORMANCE WITH APPLICABLE LAND USE PLAN

This proposed action is subject to the following land use plans:

Southern Malheur MFP (1983)
Southern Malheur Rangeland Program Summary (RPS) (1984)
Proposed Southeastern Oregon Resource Management Plan/Final EIS (2001)

This plan has been reviewed to determine if the proposed action conforms with the land use plan terms and conditions as required by 43 CFR 1610.5. and is in conformance with the above plans.

1.0 BACKGROUND

The areas identified for treatment in this assessment have gone through a variety of disturbances including repeated wildfire, brush control, plowing and seeding. Associated with the invasion of annual weed species such as cheatgrass, the fire return interval for this area has been shortened and the number and occurrence of fire has increased in the last 30-50 years.

Fire is a natural determinant of the sagebrush-steppe potential vegetation types. Historical fire patterns helped create mosaics of successional stages in both vascular plant and biological soil crust. More productive sites generally have fire-return intervals of less than 30 years (Burkhardt and Tisdale 1976; Arno and Gruell 1983; Fisher et al. 1987). Fifty to 100 years has often been cited as the average return interval in shrub-steppe regions (Wright et al.1979; Peters and Bunting 1994). Failure to treat sites after fire can result in irreversible dominance by annual species (such as cheatgrass), which prevents the return of well-developed biological soil crust (Kaltenecker 1997, Kaltenecker et al. 1999a). With fire reoccurring at a shorter rate of return and on larger areas on cheatgrass infested ranges, the potential for undesirable annual plant invasion has increased. This has increased the potential for soil erosion, soil nutrient loss, and the loss of microbiotic crust.

Wildfires in recent years culminated in the year 2000 and 2001 with severe impacts to public and private land resources, especially to rural communities, across the West. For 2001 and subsequent years, the President asked for budget and actions to support recommendations to reduce impacts in the future. Congress, with the support of the Western Governors Association approved this plan, with Congress providing the needed increase in fire management budgets to begin to address the problems that were identified. The resulting plan is referred to as the National Fire Plan (NFP). The underlying strategy is called "Protecting People and Sustaining
Resources in Fire-Adapted Ecosystems: A Cohesive Strategy."

The Vale District, through a contract with Dynamac Corporation, undertook a survey of 8 communities in eastern Oregon, to determine the hazard faced of wildfire spreading across the wildland-urban interface. The McDermitt community was surveyed as part of this effort. The contractor surveyed points along the wildland-urban interface boundary and rated each based on the wildland-type fuels present there, according to a set of characteristics that made each site more or less susceptible to wildland fire. The contractor also conducted a survey of structures and firefighting capabilities in and around the community, in order to develop a general assessment of the community's preparedness for wildland-urban interface fires, and the defensibility and firewise practices exhibited by existing structures. Two community meetings were held in McDermitt to obtain public input as to values at risk, firefighting capabilities, and recommendations for improving each community's preparedness and

defensibility. The contractor interviewed public officials and firefighting personnel in McDermitt to gain similar insights.

The results of these fuel and structure surveys, interviews, and community meetings have been incorporated into proposed recommendations for mitigation measures and improvements. These recommendations are specific to the McDermitt community, and have been tailored to suit the needs noted by the contractor in its survey.

The fuel reduction projects include practices that would reduce the accumulation or build-up of fuels in specific areas to directly reduce wildfire hazard to a community. These projects might include such practices as prescribed burning, mechanical treatments, or firebreaks.

PURPOSE AND NEED

The Jordan Resource Area of the Vale District is applying the National Fire Plan strategy to:

- Improve the resilience and sustainability of rangelands at risk;
- Conserve watersheds, native species, and biodiversity;
- Reduce wildland fire costs, losses, and damages; and
- Improve assurances of public and firefighter safety.

The proposed projects outlined in this assessment would help to meet the recommended mitigation measures described in the final McDermitt Wildland-Urban Interface, Communities-at-Risk Program.

The need for the proposed action is to convert and restore highly flammable, early seral annual rangeland to desirable perennial grass, forb and shrub rangeland. It is well known that cheatgrass ranges effectively out compete native vegetation when cover of these species has been reduced. Cheatgrass's rapid growth and its ability to utilize most of the available upper soil moisture enables it to exclude seedlings of other species. It can dominate a site the second year after wildfire and can retain its position within the plant community for four to five decades (Daubenmire 1975) and indefinitely where associated burn frequency has truncated secondary succession.

The specific objectives of the proposed action would be to replace the existing annual vegetation and restore adapted perennial grasses, forbs and shrubs. In addition, the establishment of perennial grasses, forbs and shrubs is expected to reduce wildland fire frequency and associated suppression costs and allow more natural ecological functions to occur.

Cheatgrass remains a hazard longer than that of perennial grasses because the plant dries four to six weeks earlier than perennials and is susceptible to fire one to two months longer in the Fall (Stewart and Hull 1949). In Oregon, cheatgrass ranges were found to be five hundred times more likely to burn than non cheatgrass ranges. Cheatgrass fires spread very rapidly and may extend into nearby stands of

native vegetation and reduce the cover of native perennial grass, forb and shrub species.

Implementation of this project conforms with meeting Rangeland Health Standards in an area that is dominated by highly flammable annual species and a highly fragmented shrub component. The overall goal of providing a sustainable, healthy rangeland is consistent with meeting the National Fire Plan goals and reduce wildfire risks to the wildland urban interface near McDermitt. The proposed action would improve vegetation diversity and ecological function and would provide more diverse and reliable forage for livestock and wildlife.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The proposed action is to conduct prescribed burns, herbicide applications and seeding treatments on the units identified on Map 1. Units and acres, primary vegetation in order of dominance and acres expected to be burned are identified in Table 1. Units would be treated over a 10-15 year time period so that only a portion of the area will be treated in any one year. This will allow for variances in weather, funding and other management considerations including rest of treated areas prior to and after treatment. In the event seeding treatments are not successful due to the lack of favorable precipitation, some units may require more than one treatment during this time period. The purpose of the burn, herbicide and seeding treatments would be to reduce the accumulation of annual plant material, control cheatgrass and other noxious annual weeds and to allow the establishment of perennial grass, shrub and forb species.

Prescribed Burning

Prescribed burns would be conducted primarily during the Fall to reduce the accumulation and seed source of undesirable species. Spring burning may be conducted where objectives could be met with that treatment. Map 2 shows the areas that would be treated with prescribed burning. Areas have been identified within treatment units which will not be burned to retain shrub habitat. Fuel breaks for prescribed burns would be established around the proposed unit perimeter and existing natural fuel breaks would be used where feasible. Fuel breaks would consist of roads and black lines that are between eight and twelve feet in width. Firefighter safety and preventing fire escapes would be the first priority. A complete burn (up to 100% fuel consumption) on some of the units in the proposed project area would be anticipated because of the highly flammable characteristics of cheatgrass due to its complete summer drying, fine structure and its tendency to accumulate litter (Tisdale and Hironaka 1981).

Herbicide treatment

It has been reported that high fire intensity alone will not kill all cheatgrass seed (Young 1976) and seed on or in mineral soil will survive even if most of the litter is consumed. Recent work by The Nature Conservancy (1997) and Prineville District BLM (1995) has shown that herbicide treatment enhances the establishment of desirable perennial species by reducing the seed bank and competition of annual weedy species. To control the annual noxious weed species, a herbicide treatment of glyphosate at 16-20 ounces per acres would be applied at the 2-3 leaf stage during the early Spring or Fall using ground application. At this rate remnant desirable perennial vegetation should not be killed. Herbicide treatment would be conducted following the burn treatment in units with a large component of annual noxious weed species. Unburned shrub areas in the
treatment area which contain understories dominated by annual noxious weed species may be treated with herbicide to control annual weeds and interseeded with adapted perennial grasses to enhance the understory while retaining shrub habitat. Glyphosate prevents the plant from producing amino acids that are the building blocks of plant proteins. A glyphosate Herbicide Information Profile is attached (Appendix 1).

If alternative, more effective or efficient application methods and herbicides which can meet objectives and constraints identified (i.e. not negatively impact desirable perennial vegetation) for this project are approved for use on public rangelands in Oregon they may be substituted for ground application of glyphosate and used on this project site.

Vale District's five year Integrated Weed Control Program and Environmental Assessment No. OR-030-89-19, tiered to the Northwest Area Noxious Weed Control Program Environmental Impact Statement (December 1985) and Supplement (March 1987) addresses the environmental and human impacts, and provides the design features and guidance in applying herbicides on BLM administered lands within the Vale District.

Brush Beating

Brush beating and interseeding would be utilized in the High Peak unit to reduce sagebrush composition and to release and enhance the herbaceous component of the vegetative community.

Seeding

The Fall following the burn and spray treatment, the treated area would be seeded with a mixture of adapted perennial grasses, forbs and shrubs. Both native and nonnative seed mixes would be utilized. Native plants would be used to the extent possible in areas which retain remnant native herbaceous species and have the potential for reestablishment of native species with available plant material. Based on availability and site suitability, species may include the following: bluebunch wheatgrass, bottlebrush squirreltail, great basin wildrye, Lewis flax,

western yarrow, scarlet globemallow, big sagebrush, four-wing saltbrush or other adapted natives. The perimeter of these treatment blocks may be lined with strips from 100 to 300 feet (greenstripping) with nonnative species more resistant to wildfire to break up fuel continuity and protect these areas from future wildfire and reinvasion by annual weedy species. Nonnative plants will be used in areas that are more heavily infested with invasive annual species, in areas where suitable adapted natives are not available, and in areas to provide fuel breaks to reduce the size, spread and occurrence of wildfire both in wildland urban interface areas and transitional areas adjacent to more intact shrub habitat. Species mixtures may include plants such as crested wheatgrass, great basin wildrye, bluegrass, bottlebrush squirreltail, forage kochia, four-wing saltbrush and big sagebrush. Depending upon individual species' seeding requirements, the seeding/planting would be done using a rangeland drill and/or broadcast application. Anticipated native and nonnative seed mix areas are identified on map 3. As more native plant material becomes available either through release of new cultivars or collection and propagation of locally adapted species, these may be substituted and used on areas identified for seeding with nonnative mixes.

Following treatment, the area would be closed from livestock grazing for a **minimum** period of two growing seasons. Approximately eight miles of temporary fence (map 4) built to BLM specifications to allow for wildlife movement would be constructed to keep livestock off of treated areas.

Table 1

Unit	**Primary Vegetation Present in unit**	**Acres in Unit**	**Acres Burned**
Etchart Sdg.	cheatgrass/annuals, crested wheatgrass, sagebrush	1300	0
W. McDermitt Sdg	cheatgrass/annuals, crested wheatgrass, sagebrush, greasewood	7600	6200
E. McDermitt Sdg	cheatgrass/annuals, crested wheatgrass, sagebrush, greasewood	6000	4800
Burro Sdg	cheatgrass/annuals	1300	1200
High Peak Sdg.	cheatgrass/annuals, sagebrush, crested wheatgrass	1000	900
High Peak Native	sagebrush, cheatgrass/annuals, bluegrass	2000	200
Horse Pasture	cheatgrass/annuals, sagebrush	1600	1200

Andy Fife	cheatgrass/annuals, sagebrush, rabbitbrush, basin wildrye, bluebunch wheatgrass	1500	1400
Lazy T	cheatgrass/annuals, crested wheatgrass, sagebrush	3300	2800
Ten Mile Sdg	cheatgrass/annuals, crested wheatgrass	1700	1700
Wilkinson	cheatgrass/annuals, sagebrush, greasewood, rabbitbrush, crested wheatgrass, bluebunch wheatgrass	1000	800
Flat Top Sdg	cheatgrass/annuals, crested wheatgrass, sagebrush, rabbitbrush	1000	800
Lucky Seven	cheatgrass/annuals, sagebrush, rabbitbrush, greasewood, basin wildrye,	2900	2300

2.2 Alternative A.(NO ACTION)

Under this alternative, the prescribed burns, herbicide treatments and seedings would not be conducted.

2.3 Alternative B. (Burn and Seed)

Under this alternative the area would be burned and seeded using the same procedures as outlined in the proposed action above. The herbicide treatments would not be used.

3.0 AFFECTED ENVIRONMENT

The areas identified for treatment in this assessment have gone through a variety of disturbance regimes including wildfire, brush control and seeding. Annual precipitation ranges from 8 to 11 inches, with the majority of accumulation in late winter and spring. Specific information about the resources of the area is included below:

3.1 Air Quality: Under criteria established through the Clean Air Act, as amended in 1990, the planning area has been designated as Class II, which means that no excedance of the National Ambient Air Quality Standards has been monitored in the planning area.

3.2 Cultural and Paleontological Resources: The majority of information available on the prehistory of the northern Great Basin comes from data gathered from excavations at

rockshelters like Fort Rock Cave, Roaring Springs Cave, Catlow Cave, and Dirty Shame Rockshelter. At Dirty Shame Rockshelter, the earliest dates of occupation come from charcoal sources dated to 9500 B.P. (Hanes 1988:40). The eruption of Mt. Mazama at 7050 years ago and resultant ash layer provides an excellent time marker for dating cultural habitation in the area. The postglacial warming and drying reached a peak between about 7000 and 4000 BP, and a moderate reversal of this trend established a climate roughly like that of the present after about 4000 BP (Aikens 1993). With climatic changes, came a shift in floral and faunal species and the appearance of species that characterize arid environments. Overall, the prehistory of the northern Great Basin shows long continuity and adaptive change to distinctive ecosystems with a changing climate. The persistence of lithic and textile traditions and subsistence patterns during these chronological periods supports the theory of cultural continuity throughout the northern Great Basin. The subsistence pattern was based on a broad spectrum seasonal round that utilized over 50 floral species, big and small game hunting and fishing. Pre-European contact Native American hunters and gatherers living in southeast Oregon's high desert were extremely well adapted to their environment, and used it effectively and efficiently. There was considerable intermarriage between the Northern Paiute, who occupied the study area, and the Shoshoni and Nevada Paiute and some bands living east of the Snake River were designated as half Shoshone and half Paiute. Prior to European contact and the introduction of the horse, travel was by foot, probably with the aid of pack dogs. The Native people of the Great Basin, who practiced the ancestral lifeways into the 19th century were heirs to an extremely ancient cultural tradition with a technology both effective and efficient, with many multi-functional, light-weight and expendable tools.

From 1821-1846, contact between Native Americans and immigrants increased as the push westward continued. Exploration of new areas for furs, and overland migration routes during this time posed the first serious problems and formed the basis for more intensive settlement and development. After 1847, pressures on the indigenous peoples increased as the use of overland travel routes increased. White settlements appeared for the first time and mining rushes concentrated Euro-Americans in parts of the regions and the Mormons settled into the eastern Great Basin area. By the early 1860s, the tensions between Euro-Americans and Native Americans erupted into several prolonged conflicts. During the 1880s, many Paiutes, including Winnemucca's people, lived in the vicinity of Fort McDermitt because they could get food and clothing there, and the military offered them protection. In 1889, Fort McDermitt was turned over to the Department of Interior and the land became public domain. In 1892, Indian people received allotments of land under the General Allotment Act of 1887 (the Dawes Act).On January 17, 1936, approximately 21,500 acres were withdrawn from the public domain as a grazing reserve for the Indians of Fort McDermitt, Nevada. Today there are 16,936 acres of tribal land in Nevada, 18,269 acres of allotted land in Oregon and 145 acres of allotted land in Nevada.

The cattle barons with money and cattle from outside the state, flourished in southeastern

Oregon. They acquired huge land holdings through the Oregon Swamp Lands Act, the Desert Land Act, by homesteading and by the purchase of preemptions and state-owned school lands. Large horse herds were ranged in the Owyhee Breaks by big-scale operators, and were thought to out-number cattle in the area by 1881. It was during the 1880s, that settlers increasingly came to southeast Oregon, and small communities were established near reliable water sources. Most of them were in the northern part of the county and all did not survive. By 1884, sheep had become more profitable than cattle and were moved to market in the east along the same routes that brought settlers to the west. The coming of the railroad also brought a new method of moving livestock to the stockyards. Both cattle and sheep raising prospered during the 1890s. Sheep outfits tended to be small and numerous, while cattle operations were larger and fewer. The Taylor Grazing Act of 1934 along with the Great Depression let to an abrupt and permanent drop in the number of sheep, while fostering a long-term increase in the number of beef cattle, which has continued to the present. Two cinnabar (mercury) mines, the Bretz and the Opalite, located in the far south the of the county, near McDermitt operated until shortly after World War II. Although numerous mining claims have been staked in the mineralized of the McDermitt Caldera, commercial quantities of minerals, with the exception of cinnabar have not been found.

Paleontological resources are defined as the fossilized remains of plants and animals. Fossils are of Pliocene, Miocene and Pleistocene age and are located in various volcanis tuff, sandstone/siltstone beds or Pleistocene gravels. Of particular interest are vertebrate fossils such as those of extinct camels, mammoths, mastodons, giant sloths, turtles and horses. Fossil localitites have been reported on public lands within or adjacent to the project area.

3.3 Social Economic: Social and economic uses of the project area include, livestock grazing, recreation and wildlife habitat.

3.4 Soils and Water Resources: The soils found in the McDermitt Complex area were surveyed and described in Oregon's Long Range Requirements for Water 1969, Appendix I-11, Owyhee Drainage Basin. The project area consists of twenty-three soil mapping units from this fourth-order soil survey of which twelve would receive treatments described within this document. The twelve units (described below) incorporate eight classification units that occur in various percentages within each unit and have groups that range between 0-20 percent. The other eleven units will not receive treatments.

Soils within the burned area consist of shallow to deep, mostly well drained, silt loams to sandy loams and gravely loams with some cemented pans at depths of about 20 inches. The effective rooting depth on soil Units 50, 55, 56, and 75 is shallow to moderately deep (10-20 inches) and is limited primarily by cemented pans, parent material or low annual precipitation. The remaining soil Units contain moderately deep to deep effective rooting zones.

Unit 1-2 CU 1 soils, 30 % CU 2 soils, 0-3 % slopes.
Unit 2/1-2 CU 2 soils, 0-7 % slopes.
Unit 3 CU 3 soils, 0-3 % slopes.
Unit 3-16 CU 3 soils, 30 % CU 16 soils, 0-3 % slopes.
Unit 50/1-2 CU 50 soils, 0-7 % slopes.
Unit 55/2 CU 55 soils, 3-7 % slopes.
Unit 55/2-3 CU 55 soils, 3-7 % slopes, 30 % CU 55 soils, 7-12 % slopes.
Unit 55/4 CU 55 soils, 12-20 % slopes.
Unit 55-56/2-3 CU 55 soils, 3-7 % slopes, 30 % CU 56 soils, 7-12 % slopes.
Unit 55-57/2-3 CU 55 soils, 3-7 % slopes, 30 % CU 57 soils, 7-12 % slopes.
Unit 57/1-2 CU 57 soils, 0-3 % slopes, 30 % CU 57 soils, 7-12 % slopes.
Unit S75-55/4-3 CU S75 soils, 30 % CU 55 soils, 7-20 % slopes.

Classification Unit 1
Soils are deep, well drained, medium-textured soils derived from recent alluvium on nearly level fans and bottomlands. Soils occur usually at elevations of 2,500 to 4,700 feet and have a high potential for range seeding. Average annual precipitation ranges from 8-11 inches and mean annual air temperature centers around 47 degrees F. The soil profile by depth consist of gray silt loam, brown silt loam, to stratified very fine sandy loam and silt loam with some fine gravel layers.

Classification Unit 2
Soils are somewhat excessively drained, moderately coarse-textured soils in alluvium of fans and bottomlands along streams. Soils occur usually at elevations of 3,500 to 5,000 feet and have a high potential for range seeding. Average annual precipitation ranges from 8-10 inches and mean annual air temperature centers around 47 degrees F. The soil profile by depth consist of brown sandy loam, to gray sandy loam to gray gravelly sandy loam. Depth to gravelly sandy loam is usually 20 inches.

Classification Unit 3
Soils are shallow, silty, well drained underlain by gravel on nearly level recent fans and bottomlands. Soils occur usually at elevations of 3,000 to 4,500 feet and have a good potential for range seeding. Average annual precipitation ranges from 8-10 inches and mean annual air temperature centers around 47 degrees F. The soil profile by depth consist of gray very fine sandy loam, to brown silt loam to brown loamy gravel. Depth to gravel substratium is usually 16 inches.

Classification Unit 50
Soils are shallow, somewhat excessively drained underlain by hardpan on nearly level old fans and terraces. Soils occur usually at elevations of 4,000 to 5,000 feet and have a some potential for range seeding. Average annual precipitation ranges from 8-10 inches and mean annual air

temperature centers around 45 degrees F. The soil profile by depth consist of brown loamy sand, to brown sandy loam, to brown sandy loam, to silica cemented pan in a gravelly loam matrix 4 to 20 inches thick.

Classification Unit 55
Soils are shallow, loamy, well drained with cemented pans on very extensive to moderately steep old fans and high terrace remnants. Soils occur usually at elevations of 3,000 to 5,500 feet and have a good potential for range seeding. Average annual precipitation ranges from 8-11 inches and mean annual air temperature centers around 47 degrees F. The soil profile by depth consist of brownish gray gravelly loam, to brown gravelly loam, to silica and lime cemented pan 6 to 20 inches thick over stratified loamy sand and gravel.

Classification Unit 56
Soils are shallow, well drained with clayey subsoils and cemented pans on very extensive, gently sloping to moderately steep old fans and high terrace remnants. Soils occur usually at elevations of 3,000 to 5,500 feet and have potential for range seeding limited by hardpan and slope. Average annual precipitation ranges from 8-11 inches and mean annual air temperature centers around 47 degrees F. The soil profile by depth consist of brownish gray gravelly loam, to light brown gravelly clay loam, to brown gravelly heavy clay loam, to silica cemented gravelly pan 6 to 20 inches thick over stratified loamy sand and gravel.

Classification Unit 57
Soils are deep, well drained, and derived from loamy materials on old fans. Soils occur usually at elevations of 4,000 to 4,500 feet and have a high potential for range seeding. Average annual precipitation ranges from 8-11 inches and mean annual air temperature centers around 47 degrees F. The soil profile by depth consist of light brownish gray sandy loam, to brown loam, to brown light clay loam, to brown loam.

Classification Unit S75
Soils are shallow, loamy, well drained, extremely stoney on gently undulating to rolling plateaus of basalt, rhyolite, or welded tuff. Soils occur usually at elevations of 4,000 to 5,500 feet and have little potential for range seeding limited by surface stones. Average annual precipitation ranges from 8-11 inches and mean annual air temperature centers around 45 degrees F. The soil profile by depth consist of brownish gray gravelly loam, to light brown gravelly clay loam, to brown gravelly heavy clay loam, to silica cemented gravelly pan 6 to 20 inches thick over stratified loamy sand and gravel.

Due to the repeated disturbance that has occurred and the dominance of annual vegetative species, Microbiotic crusts are lacking on much of the treatment area.

No perennial flowing drainage lies within the project area. The area encompasses portions of

intermittently flowing Oregon Canyon Creek and its main tributary streams, Tenmile Creek and Jackson Creek. Oregon Canyon Creek then flows into the Quinn River. Numerous smaller ephemeral and intermittent channels also drain into Oregon Canyon Creek from the site. The nearest reliable perennial water and associated riparian vegetation in the area is located in the hilly to mountainous headwaters of the named streams. Numerous perennial seeps and spring are scattered throughout the basin upslope of the town of McDermitt, Nevada, although most are located on private land.

3.5 Vegetation: Sagebrush-bunchgrass communities comprised the historic vegetation in the treatment area. Wyoming big sagebrush was the primary brush component with interspersed pockets of basin big sagebrush, greasewood and green rabbitbrush. The understory component included bluebunch wheatgrass, needlegrass, bottlebrush squirreltail, basin wildrye, Sandberg's bluegrass and a variety of forbs. Understory dominance ranged from bluebunch wheatgrass of sites receiving more effective moisture to needlegrass/bluegrass on dryer sites. No special status species are known to occur, or are suspected, in the project area.

A variety of disturbances including repeated wildfire, plowing, grazing, brush control and seeding have altered the vegetative communities on the treatment area. Currently, the vegetative community consists mainly of cheatgrass and other annual grasses and forbs with inclusions of perennial grass and brush species (Table 1). Annual exotic weedy species occur over much of the project area and include cheatgrass, tumble mustard, Russian thistle and knapweed.

3.6 Wildlife

Management Species

The key wildlife species for the project area are sagebrush obligate birds, mule deer and pronghorn antelope. The project area is key mule deer and pronghorn antelope winter range, as well as year-round habitat for sagebrush obligate birds, mule deer and pronghorn.

Sage grouse (*Centrocercus urophasianus*) are known to seasonally inhabit areas adjacent to the project area. Public interest is increasing over the management of this species as a result of the potential listing of this species under the Endangered Species Act (ESA). The likelihood that sage grouse use the project area extensively is not probable due to the distance from the closest lek (approximately four miles), the lack of shrub overstory for hiding cover, and the lack of native grasses and forbs. Numerous field visits over a period of several years to the project area have failed to turn up sage grouse sign; however, sage grouse are thought to infrequently occupy the area. During severe winters, grouse are known to descend from adjacent higher elevations into the project area (in areas where there is sagebrush cover present).

Habitat Characteristics

The project area currently does not have the desired diversity or shrub structure important to sagebrush obligate species. The area is primarily dominated by annual grass and forb species and is lacking the shrub cover and native understory important for local wildlife species and mule deer and pronghorn that winter in the area.

The vegetative community in the project area may pose a potential barrier to wildlife movement. The project area is composed of sagebrush canopy Class 1 (0%), Class 2 (Trace to 5%), Class 3 (>5% to 15%) and Class 4 (>15% to 25%) cover types, with Class 1 and 2 being the dominant classes (see Appendix 2). On the pasture and allotment scale, shrub cover in the project area is highly fragmented. Wildlife species depend on sagebrush corridors of these shrubs for movement. The adjacent lands have adequate shrub cover, but currently there are no corridors with shrubs present to facilitate movement between the project area and the adjacent areas.

Wildlife Data

No wildlife inventory surveys have been conducted within the project area, with the exception of sage grouse lek inventories conducted between 1995 and 1998. The following species have been observed during numerous field visits to the project area:

> sage thrasher, loggerhead shrike, Brewer's blackbird, western meadowlark, American robin, short-eared owl, golden eagle, American crow, red-tailed hawk, ferruginous hawk, mourning dove, horned lark, California quail, turkey vulture, burrowing owl, American kestrel, northern harrier, common raven, black-tailed jackrabbit, cottontail rabbit, mule deer, coyote, pronghorn antelope, gopher snake. Other species that are likely to occur within the project area include: Swainson's hawk, killdeer, rock wren, brown-headed cowbird, vesper sparrow, Brewer's sparrow, sage grouse, desert horned lizard, sagebrush lizard, western fence lizard, side-blotched lizard, yellow-bellied racer, common garter snake, great basin rattlesnake, badger, sagebrush vole, deer mouse, northern pocket gopher, great basin pocket mouse.

There are no federally listed or candidate species of wildlife that occupy the project area. As a result, there is no need to consult with the US Fish and Wildlife Service regarding Section 7 of the Endangered Species Act.

4.0 ENVIRONMENTAL IMPACTS

This section describes the anticipated environmental consequences on the resources if the alternatives are implemented. The general effects of each alternative on resource categories is addressed. Direct effects are caused by an action and occur at the same time and place. Indirect effects are caused by an action and occur later in time or farther removed in distance.

Cumulative effects are impacts produced by the action and might add to other past, present, and reasonably foreseeable future actions, and can take place over a period of time (40 CFR 1508.7 and 1508.8). Where appropriate, resource information also addresses time of impacts (duration), relation of the impacts to other resources (context), and severity (intensity), all of which are factors of significance.

4.1 Proposed Action

The effects on the human environment associated with the proposed herbicide treatment have been addressed in the District's 5-Year Noxious Weed Control Program and Environmental Assessment. The potential impacts, mitigation measures and associated design features are described in the Environmental Assessment (EA-OR-030-89-19) and the Amended 1994 Decision Record. There would be no changes in the implementation of the programmatic EA in regards to the proposed action. Impacts described below would be spread over the expected 10 - 15 years it would take to fully implement the treatments.

4.11 Air Quality: Prescribed burning would increase the particulate matter and gasses in the atmosphere for the duration of the burn which could cause some short-term temporary reduction in visibility. An inversion or northerly winds could have minor impacts on McDermitt, Nevada, located just south of the project area and the only population center near the project area. The impacts would be minor, due to the fuel source being fine fuels of annual grasses. The spraying and seeding operation would not have a long-term effect on the quality of the air.

4.12 Cultural and Paleontological Resources: Prehistoric sites have been documented in this area through previous cultural resource surveys. Sites are located around water sources and were used primarily during the late spring through summer seasons during hot weather. The majority of sites are lithic scatter sites and campsites that show occupation of an area through the presence of flakes, tools and lithic procurement. Prior to the burn operations a Class I file search and data review will be conducted to locate sites in the area of the burn. After burning and spraying but prior to seeding operations, a survey for Cultural Resources will be conducted at the Class II level. A Class II inventory is a stratified or statistically based survey designed to characterize the probable density, diversity and distribution of cultural properties in an area.. Class II surveys would be used to demonstrate that the area sampled did not support human use to the degree that would make further inventory useful. A Class III inventory, designed to identify and record all cultural properties visible from the surface by using close-interval parallel transects may be conducted where significant resources are found or expected.

For fossil flora and faunal resources a Class I file search and data review will also be conducted to locate fossil flora and faunal resources that may be affected by the fire activity. If fossil are

located within the area, surveys to access the nature and extent of the fossil locality will be conducted. If significant Paleontological or cultural resources are located they would be flagged and either avoided or recorded.

4.13 Social Economic: In the short term livestock grazing opportunities would be reduced to implement the proposed action. Livestock use will be limited or excluded in each unit in the year treatment is initiated to allow sufficient fine fuels for burning. Following seeding, livestock will be excluded from the treated area for a minimum of two growing seasons to allow establishment of seeded species. In the long term the establishment of more diverse perennial vegetation would enhance forage quality for wildlife and livestock and provide a more stable forage base. Establishment of seeded perennial vegetation would decrease the size and intensity of wildfire in the long term which would decrease costs of suppression and decrease economic risks and costs to adjoining private property and structures from wildfire.

4.14 Soils and water resources: Soils within the area to receive treatments contain fine-textured to loamy sand soil surfaces. The loss of vegetation and vegetative matter in the surface horizon from the proposed treatments would subject the soils to enhanced wind and water erosion. Because this area receives limited precipitation, burning with insufficient soil moisture could cause the loss of some soil microorganisms and crusts, vegetative matter, soil nutrients and some remnant desirable grass and shrub species. The greatest impacts to soils are from the removal of vegetation and the resultant wind and water erosion. Impacts to the soil resources are expected to be the greatest after the first year of burning and the smallest from the second year after herbicide application. Moderate soil impacts would be expected during the drilling phase of the project. However, the effects are not expected to be significant because of minimal slopes and relatively low precipitation within the project area. In addition, wind and water erosion rates will decrease after the seedings become established. Using prescribed fire as a partial control measure for annual species would not cause great changes in surface soil physical and chemical properties because of the low fuel loading (1 hr fuels) and rapid rates of spread. The greatest effect would be the short term loss of soil productivity due to a temporary change in vegetative cover, surface organic matter and soil organisms in the upper few inches of the surface. Soil surface characteristics should return to prefire conditions within three growing seasons, maybe longer for microbiotic crusts. The impact of rangeland drilling equipment would loosen and displace the top two to three inches of the soil within the furrows which are twelve inches apart. This would be temporary, however, as the furrows act as moisture traps and the new plants would begin to stabilize the soil within the first year of drilling.

Depletion of soil nutrients and effects to the reestablishment of microbiotic crust formation from water erosion would be short-term until revegetation has occurred. The potential for wind erosion effects on crust and nutrients once vegetation is reestablished would also be reduced. In addition, water erosion in this area is low due to relatively flat to rolling terrain, whereas wind erosion on Units 2 and 50 are rated as moderate because of soil surface textures. Recovery of

all types of mirobiotic crust components is faster in fine-textured soils than in course-textured soils, as fine-textured soils are often stabilized by chemical and rain crusts and retain soil surface moisture longer (as reviewed in Harper and Marble 1988, Johansen 1993; Ladyman and Muldavin 1996). Recovery of some site's wind resistance is also more rapid in fine-textured soils, probably due to physical or rain crust formation after rainfall. Silty soils show a 50% recovery of wind resistance after a single large rain event. This physical or rain crust layer is often harder than the rest of the soil because compounds such as salts, lime, and silica are deposited at the surface as water evaporates.

Microbiotic crusts would not be affected by the proposed action and treatments except during the short-term disturbance from drilling seed into the soil surface. Over the long-term because microbiotic crust expand very slowly over sites limited by moisture, the recovery rate of crusts that exist after fire and in some of the same areas that have burned over the last 30 years will be limited. Microbiotic crustal organisms are metabolically active only when wet; thus, recovery is faster in regions and microsites with greater effective precipitation (Johansen et al. 1993; Harper and Marble 1988). Crusts on north and east slopes, as well as at higher elevations, will recover more quickly than crusts on south and west slopes and at lower elevations.

Herbicide studies on microbiotic crust have shown that crustal species are differentially affected, depending on the compound and the species tested (Metting 1981). One study addressed herbicide effects on intact biological soil crusts. Direct application of two glyphosate herbicides (Roundup and Accord) on moss-dominated biological soil crust had no short-term negative impact on bryophyte cover. In fact, Bryophyte cover decreased significantly in control plots due to litter buildup from exotic annual grasses that had invaded the site. There is little information on the effects of repeated application or long-term effects of glyphosate and other herbicides on crustal species (Youtie et al. 1999).

Water quantity in the form of overland flow is expected to slightly increase over the short-term (one-three years) until vegetation in burned and herbicide applied treatment areas recover and provide interception and cover protection from high-intensity thunderstorms. Once regrowth of vegetation occurs in these areas overland flows would decrease from increased vegetative litter and infiltration of water into the soil profile thereby the possibility of sediment transport to streams would be reduced. Because of the low precipitation of the area, the relatively short half-life of the herbicide that will be applied, and low potential for runoff soil and water resources should not be affected by the application of the proposed herbicide.

4.15 Vegetation: It is anticipated that fire would burn approximately sixty to one hundred percent of the units identified, depending upon vegetation type and fuel continuity. An estimate of the acres that will be burned in each unit is made in Table 1. The units in which it is estimated the burn area will be less than 90 % of the unit are expected to burn in a mosaic due to inclusions of discontinuous fuels. The moderate to low severity fires are not expected to

substantially damage remnant perennial grasses in the area. The fire would reduce the accumulation of litter and seed stores of annual species and allow more efficient application of herbicides. Herbicide treatment would further suppress the production and seed bank of annual weed species and increase the probability of successful establishment of seeded species and at the proposed application rates would not kill remnant perennial grass and shrub species. A short-term loss of cover and forage could result from the treatments; however, in the long-term, habitat quality and quantity should increase with the increase in perennial forbs, shrubs and grasses. Successful establishment of seeded perennial vegetation would decrease the size, intensity and frequency of wildfire in the project area in the long term as well as provide control of and prevent reinvasion by annual noxious weed species. Diversity, resilience, and sustainability of treated rangelands would be enhanced.

Replacing nonnative annual species with a mixture of nonnative perennial species would allow control of noxious weed species while enhancing and emulating more natural ecological functioning of those sites and allow for higher probability of successful future conversion to native perennial species if adapted plant materials become available. Successful establishment of more fire resistant perennial species would break up fuel continuity and help reduce the size of wildfire. Establishment of seeded perennial species is reversible and would not be a irretrievable or irreversible commitment of resources.

4.16 Wildlife: The impact to wildlife would primarily be a result of habitat modification. However, the habitat modification would be conducted over a 10-15 year period of time, and would not result in a significant loss of shrub cover due to the fact the project area is currently lacking shrub cover over a large portion of the area. The existing shrub cover present in the project area would be protected, except in areas where the fire hazard is high due to hazardous fuel conditions and the proximity to private lands.

Over the 10-15 year project period, wildlife populations should not be negatively impacted due to low population numbers and species diversity supported by the existing community. The areas adjacent to the project area would continue to provide important shrub cover and a perennial grass understory for wildlife use.

The establishment of perennial species and native shrubs would help prevent the spread of annual grasses into the understory of the adjoining lands, and ultimately, would help prevent the conversion of perennial shrubland to annual grasslands. Perennial species would aid in protecting the remaining native shrub habitat that is critical to sagebrush obligate species. By establishing native shrubs in the project area, the proposed action would also improve the habitat connectivity of the area, which is critical for wildlife movement.

Prescribed burns would be conducted primarily in the fall to reduce the mortality of wildlife species. The proposed herbicide is slightly toxic to wild birds and would be applied during early spring (before nesting season) or fall to help reduce the impacts to wildlife.

In the long term, the proposed action would benefit wildlife by providing structural diversity and improved forage conditions. The establishment of perennial species and native shrubs would improve the suitability of the project area for sagebrush obligate species. The proposed action would also improve the availability of sagebrush for the wintering mule deer and pronghorn in the area.

4.20 Alternative A.(NO ACTION)

4.21 Air Quality: The short term air quality impacts identified in the proposed action would not occur. In the long term air quality may be impacted during and after large scale wildfires which would have good probability of occurring with no action.

4.22 Cultural and Paleontological Resources: There would be no impacts to cultural or paleontological resources as a result of this alternative

4.23 Social Economic: Rangeland productivity on the sites has declined to the degree that no action is uneconomical over the long-term. Little or any potential for site improvement is possible with no action. The potential for recurring wildland fires would continue to exist throughout the project area with associated displacement and loss of recreation, livestock grazing and wildlife use.

4.24 Soils: The short term negative impacts and long term positive impacts identified in the proposed action would not occur. The potential for additional soil erosion and negative impacts is likely with the potential for recurring wildfire which would continue to exist.

4.25 Vegetation: The vegetation condition of the area would continue to be the same as the present. Cheatgrass and other weedy annual species would continue to increase and occupy the site and provide a seed source into surrounding areas.

4.26 Wildlife: There would be little potential for habitat improvement with the no action alternative. Wildlife species diversity within the project area would be expected to remain low as a result of the lack of structure and plant diversity. There would continue to be a high potential for further degradation of currently suitable habitat in adjacent areas. Sagebrush habitat loss would continue with the expansion of exotic annual grasses and the frequent fires that are characteristic of cheatgrass dominated sites.

4.30 Alternative B. Burn and Seeding

4.31 Air Quality: Prescribed burning would increase the particulate matter and gasses in the atmosphere for the duration of the burn which could cause some short-term temporary reduction in visibility. An inversion or northerly winds could have minor impacts on McDermitt, Nevada, located just south of the project area and the only population center near the project area. The impacts would be minor, due to the fuel source being fine fuels of annual grasses.

4.32 Cultural and Paleontological Resources: The methodology for locating prehistoric and historic cultural resources under this alternative would be the same as under the Proposed Action alternative.

4.33 Social Economic: Impacts due to prescribed fire and seeding would be the same as described in the proposed action. Impacts due to herbicide application would not occur. Without the herbicide treatment seeding results may be somewhat diminished as compared to the proposed action due to more competition from the annual species seedbank.

4.34 Soils: Impacts due to prescribed fire and seeding would be the same as described in the proposed action. Impacts due to herbicide application would not occur. Positive impacts to soils associated with success of seeded species may be less than under the proposed action due to more competition from annual species without the herbicide treatment.

4.35 Vegetation: Impacts due to prescribed fire and seeding would be the same as described in the proposed action. Impacts due to herbicide application would not occur. Positive impacts to vegetation associated with success of seeded species may be less than under the proposed action due to more competition from annual species without the herbicide treatment.

4.36 Wildlife: Impacts due to prescribed fire and seeding would be the same as described in the proposed action. Impacts due to herbicide application would not occur. Positive impacts to wildlife associated with success of seeded species may be less than under the proposed action due to more competition from annual species without the herbicide treatment.

4.40 Critical elements: The following resources were all considered in preparation of this assessment, but are either not present or no impacts are expected:

CRITICAL ELEMENTS

Farmlands, Prime/Unique
Floodplains
Native American Religious Concerns
T&E Species
Wastes, Hazardous/Solid
Water Quality

Wetlands/Riparian Zones
Energy and Mineral Development
ACECs
Wild & Scenic Rivers
Wilderness
Environmental Justice

5.0 DESCRIPTION OF MITIGATION MEASURES AND RESIDUAL IMPACTS

To ensure firefighter safety, prescribed burn plan prescriptions and fireline safety procedures will be strictly followed at all times. Project objectives may be compromised if firefighter safety is jeopardized.

The design features and mitigation measures for herbicide application as described in the E.A. (OR-030-89-19 as amended in 1994) titled "The Vale District's five Year Noxious Weed Control Program" will be strictly followed. All herbicides will be applied in accordance with EPA label requirements.

Livestock will not be allowed to graze the seedings for two years or the amount of time required to allow the seeding(s) to become established. Adjustments will be made to livestock numbers proportionate to the area(s) out of production.

Temporary fencing built to protect treated areas will be flagged and built to BLM specifications to allow for wildlife movement.

Monitoring pretreatment and post treatment will be done yearly within the project area.

6.0 PERSONS/AGENCIES CONSULTED

Oregon Department of Fish and Wildlife
Identified Interested Publics and Livestock Permittees in associated allotments
Malheur County Court

7.0 PARTICIPATING STAFF

Brandon Knapton - Rangeland Management Specialist
Cameron Rasor - Rangeland Management Specialist
Tom Miles - Supervisory Rangeland Management Specialist
Diane Pritchard - Archeologist
Marisa Meyer - Wildlife Biologist

Joe-Riley Epps - Fuels Specialist
Cynthia Tait - Fish Biologist
Jack Wenderoth - Hydrologist/Soils
Jean Findley - Botanist
Tracy Skerjanec - Assistant Fire Management Officer
Jason Simmons - Station Manager - Jordan Valley
Jerry Erstrom - Vale District Weed Coordinator

FINDING OF NO SIGNIFICANT IMPACTS

The Jordan Resource Area of the Bureau of Land Management (BLM) Vale District has analyzed a proposal for the McDermitt Complex Restoration/Rehabilitation and Noxious Weed Control Project. The proposed project sets forth land treatment activities designed to reduce fuel loadings, improve rangeland health, control noxious weeds and reduce the risk of wildfire to the residences and other structures in the McDermitt urban interface area while protecting and enhancing other resource values. The attached Environmental Assessment (EA 030-99-009) contains a detailed description and analysis of two action alternatives and a no action alternative. This EA was prepared under the guidance provided by the Southern Malheur Management Framework Plan and Rangeland Program Summary and the Proposed Southeastern Oregon Resource Management Plan and Final EIS. The proposed action would take highly flammable, mostly exotic annual rangeland and convert it to less flammable perennial plant species, enhancing resource values while reducing fire frequency and the potential for serious impacts to the urban interface. These are positive impacts to the overall human environment with few, if any, negative impacts. In relation to context, the project's affected region is localized and the effects of implementation are limited to the area affected by the project. This is particularly true in light of the mitigation measures adopted into the project specifications. In relation to intensity or severity, mitigation measures have been promulgated to protect public health and safety. Further, no unique characteristics are involved, there are no highly uncertain, unique or unknown risks, and the project does not set a precedent for future actions that could have significant effects. The action also does not appear to be related to any other action that could be significant, there will be no impacts to sites that could be listed on the National Register of Historic Places, no scientific, cultural or historic resources will be lost, and there will be no violation of any law or requirement protecting the environment. There will be no impacts to any species listed under the Endangered Species Act. There will be no irretrievable or irreversible commitment of resources as a result of the proposed action. While any land management activity invariably and by definition entails environmental effects, I have determined, based upon the analysis of environmental impacts contained in the referenced EA, and what is written above, that the potential impacts raised by the proposed project will not be significant and that, therefore, preparation of an environmental impact statement is not required.

s/Jerry Taylor, Jordan Field Manager 6/11/2002

_____ _____

Authorized Official Date

Decision Record

McDermitt Complex, Restoration/Rehabilitation and Noxious Weed Control Project
Environmental Assessment, OR-030-99-009
Jordan Resource Area, Vale District
Bureau of Land Management

This Decision Record documents my decesion to select the proposed action for implementation of the McDermitt Complex, Restoration/Rehabilitation and Noxious Weed Control Project. This alternative was analyzed in the attached Environmental Assessment (EA), OR-030-99-009. The EA is in conformance with the Southern Malheur Management Framework Plan and Rangeland Program Summary and the Proposed Southeastern Oregon Resource Management Plan and Final EIS.

Public Review

Subsequent to the preparation of the EA, the publishing of a Legal Notice setting forth the EA's availability for public comment, posting to the Vale District internet site, notification of identified interested publics, and notification of affected permittees, no comments were received.

Decision

My decision to select the proposed action is based upon the interdisciplinary analysis contained in EA OR-030-99-009 as well as the supporting record and field review.

All mitigation measures, design features and monitoring processes described in the EA are incorporated into project implementation plans. Among these are:

To ensure firefighter safety, prescribed burn plan prescriptions and fireline safety procedures will be strictly followed at all times. Project objectives may be compromised if firefighter safety is jeopardized.

- The design features and mitigation measures for herbicide application as described in the E.A. (OR-030-89-19 as amended in 1994) titled "The Vale District's five Year

Noxious Weed Control Program" will be strictly followed. All herbicides will be applied in accordance with EPA label requirements.

- Livestock will not be allowed to graze the seedings for two years or the amount of time required to allow the seeding(s) to become established. Adjustments will be made to livestock numbers proportionate to the area(s) out of production.

- Temporary fencing built to protect treated areas will be flagged and built to BLM specifications to allow for wildlife movement.

- Monitoring pretreatment and post treatment will be done within the project area to assess success of meeting treatment objectives, preventing unintended impacts and determining if continued or repeat treatment will be necessary.

Decision Rationale

The proposed project sets forth land treatment activities designed to reduce fuel loadings, improve rangeland health, control noxious weeds and reduce the risk of wildfire to the residences and other structures in the McDermitt urban interface area while protecting and enhancing other resource values. These are positive impacts to the overall human environment with few, if any, negative impacts. In relation to context, the project's affected region is localized and the effects of implementation are limited to the area affected by the project. This is particularly true in light of the mitigation measures adopted into the project specifications. In relation to intensity or severity, mitigation measures have been promulgated to protect public health and safety. Further, no unique characteristics are involved, there are no highly uncertain, unique or unknown risks, and the project does not set a precedent for future actions that could have significant effects. The action also does not appear to be related to any other action that could be significant, there will be no impacts to sites that could be listed on the National Register of Historic Places, no scientific, cultural or historic resources will be lost, and there will be no violation of any law or requirement protecting the environment. There will be no impacts to any species listed under the Endangered Species Act. There will be no irretrievable or irreversible commitment of resources as a result of the proposed action.

The proposed project will have no effect on Prime/Unique Farmlands, Floodplains, Native American Religious Concerns, T&E Species, Hazardous or Solid Wastes, Water Quality, Wetlands, Riparian Zones, Energy and Mineral Development, Areas of Critical Environmental Concern, Wild and Scenic Rivers, Wilderness or Environmental Justice.
This plan meets none of the criteria for significance. The actions is consistent with the Southern Malheur Management Framework Plan and Rangeland Program Summary and the Proposed Southeastern Oregon Resource Management Plan and Final EIS.

s/Jerry Taylor, Jordan Field Manager 8/19/2002

Authorized Official Date

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Appendix1

Extension Toxicology Network

Glyphosate Information Profile

A Pesticide Information Project of Cooperative Extension Offices of Cornell University, Oregon State University, the University of Idaho, and the University of California at Davis and the Institute for Environmental Toxicology, Michigan State University. Major support and funding was provided by the USDA/Extension Service/National Agricultural Pesticide Impact Assessment Program.
EXTOXNET primary files maintained and archived at Oregon State University
Revised June 1996

Glyphosate

Trade and Other Names**:** Trade names for products containing glyphosate include Gallup, Landmaster, Pondmaster, Ranger, Roundup, Rodeo, and Touchdown. It may be used in formulations with other herbicides.

Regulatory Status**:** Glyphosate acid and its salts are moderately toxic compounds in EPA toxicity class II. Labels for products containing these compounds must bear the Signal Word WARNING. Glyphosate is a General Use Pesticide (GUP).

Chemical Class: Not Available

Introduction**:** Glyphosate is a broad-spectrum, nonselective systemic herbicide used for control of annual and perennial plants including grasses, sedges, broad-leaved weeds, and woody plants. It can be used on non-cropland as well as on a great variety of crops. Glyphosate itself is an acid, but it is commonly used in salt form, most commonly the isopropylamine salt. It may also be available in acidic or trimethylsulfonium salt forms. It is generally distributed as water-soluble concentrates and powders. The information presented here refers to the technical grade of the acid form of glyphosate, unless otherwise noted.

Formulation: Glyphosate itself is an acid, but it is commonly used in salt form, most commonly the isopropylamine salt. It may also be available in acidic or trimethylsulfonium salt forms. It is generally distributed as water-soluble concentrates and powders.

Toxicological Effects:

- **Acute toxicity:** Glyphosate is practically nontoxic by ingestion, with a reported acute oral LD50 of 5600 mg/kg in the rat. The toxicities of the technical acid (glyphosate) and the formulated product (Roundup) are nearly the same. The oral LD50 for the trimethylsulfonium salt is reported to be approximately 750 mg/kg in rats, which indicates moderate toxicity. Formulations may show moderate toxicity as well (LD50 values between 1000 mg/kg and 5000 mg/kg). Oral LD50 values for glyphosate are greater than 10,000 mg/kg in mice, rabbits, and goats. It is practically nontoxic by skin exposure, with reported dermal LD50 values of greater than 5000 mg/kg for the acid and isopropylamine salt. The trimethylsulfonium salt has a reported dermal LD50 of greater than 2000 mg/kg. It is reportedly not irritating to the skin of rabbits, and does not induce skin sensitization in guinea pigs. It does cause eye irritation in rabbits. Some formulations may cause much more extreme irritation of the skin or eyes. In a number of human volunteers, patch tests produced no visible skin changes or sensitization. The reported 4-hour rat inhalation LC50 values for the technical acid and salts were 5 to 12 mg/L, indicating moderate toxicity via this route. Some formulations may show high acute inhalation toxicity. While it does contain a phosphatyl functional group, it is not structurally similar to organophosphate pesticides which contain organophosphate esters, and it does not significantly inhibit cholinesterase activity.

- **Chronic toxicity:** Studies of glyphosate lasting up to 2 years, have been conducted with rats,dogs, mice, and rabbits, and with few exceptions no effects were observed. For example, in a chronic feeding study with rats, no toxic effects were observed in rats given doses as high as 400 mg/kg/day. Also, no toxic effects were observed in a chronic feeding study with dogs fed up to 500 mg/kg/day, the highest dose tested.

- **Reproductive effects:** Laboratory studies show that glyphosate produces reproductive changes in test animals very rarely and then only at very high doses (over 150 mg/kg/day). It is unlikely that the compound would produce reproductive effects in humans.

- **Teratogenic effects:** In a teratology study with rabbits, no developmental toxicity was observed in the fetuses at the highest dose tested (350 mg/kg/day). Rats given doses up to 175 mg/kg/day on days 6 to 19 of pregnancy had offspring with no teratogenic effects, but other toxic effects were observed in both the mothers and the fetuses. No toxic effects to the fetuses occurred at 50 mg/kg/day. Glyphosate does not appear to be teratogenic.

- **Mutagenic effects:** Glyphosate mutagenicity and genotoxicity assays have been negative [58]. These included the Ames test, other bacterial assays, and the Chinese Hamster Ovary (CHO) cell culture, rat bone marrow cell culture, and mouse dominant lethal assays. It appears that glyphosate is not mutagenic.

- **Carcinogenic effects:** Rats given oral doses of up to 400 mg/kg/day did not show any signs of cancer, nor did dogs given oral doses of up to 500 mg/kg/day or mice fed glyphosate at doses of up to 4500 mg/kg/day. It appears that glyphosate is not carcinogenic.

- **Organ toxicity:** Some microscopic liver and kidney changes, but no observable differences in function or toxic effects, have been seen after lifetime administration of glyphosate to test animals.

- **Fate in humans and animals:** Glyphosate is poorly absorbed from the digestive tract and is largely excreted unchanged by mammals. At 10 days after treatment, there were only minute amounts in the tissues of rats fed glyphosate for 3 weeks. Cows, chickens, and pigs fed small amounts of glyphosate had undetectable levels (less than 0.05 ppm) in muscle tissue and fat. Levels in milk and eggs were also undetectable (less than 0.025 ppm). Glyphosate has no significant potential to accumulate in animal tissue.

Ecological Effects:

- **Effects on birds:** Glyphosate is slightly toxic to wild birds. The dietary LC50 in both mallards and bobwhite quail is greater than 4500 ppm.

- **Effects on aquatic organisms:** Technical glyphosate acid is practically nontoxic to fish and may be slightly toxic to aquatic invertebrates. The 96-hour LC50 is 120 mg/L in bluegill sunfish, 168 mg/L in harlequin, and 86 mg/L in rainbow trout. The reported 96-hour LC50 values for other aquatic species include greater than 10 mg/L in Atlantic oysters, 934 mg/L in fiddler crab, and 281 mg/L in shrimp. The 48-hour LC50 for glyphosate in Daphnia (water flea), an important food source for freshwater fish, is 780 mg/L. Some formulations may be more toxic to fish an aquatic species due to differences in toxicity between the salts and the parent acid or to surfactants used in the formulation. There is a very low potential for the compound to build up in the tissues of aquatic invertebrates or other aquatic organisms.

- **Effects on other organisms:** Glyphosate is nontoxic to honeybees. Its oral and dermal LD50 is greater than 0.1 mg/ bee. The reported contact LC50 values for earthworms in soil are greater than 5000 ppm for both the glyphosate trimethylsulfonium salt and Roundup.

Environmental Fate:

- **Breakdown in soil and groundwater:** Glyphosate is moderately persistent in soil, with an estimated average half-life of 47 days. Reported field half-lives range from 1 to 174 days. It is strongly adsorbed to most soils, even those with lower organic and clay content. Thus, even though it is highly soluble in water, field and laboratory studies show it does not leach appreciably, and has low potential for runoff (except as adsorbed to colloidal matter). One

estimate indicated that less than 2% of the applied chemical is lost to runoff. Microbes are primarily responsible for the breakdown of the product, and volatilization or photodegradation losses will be negligible.

- **Breakdown in water:** In water, glyphosate is strongly adsorbed to suspended organic and mineral matter and is broken down primarily by microorganisms. Its half-life in pond water ranges from 12 days to10 weeks.

- **Breakdown in vegetation:** Glyphosate may be translocated throughout the plant, including to the roots. It is extensively metabolized by some plants, while remaining intact in others.

Physical Properties:

- **Appearance:** Glyphosate is a colorless crystal at room temperature.

- **Chemical Name:** N-(phosphonomethyl) glycine

- **CAS Number:** 1071-83-6

- **Molecular Weight:** 169.08

- **Water Solubility:** 12,000 mg/L @ 25 C

- **Solubility in Other Solvents:** is. in common organics (e.g., acetone, ethanol, and xylene)

- **Melting Point:** 200 C

- **Vapor Pressure:** negligible

- **Partition Coefficient:** -3.2218 - -2.7696

- **Adsorption Coefficient:** 24,000 (estimated)

Exposure Guidelines:

- **ADI:** 0.3 mg/kg/day

- **MCL**: Not Available

- **RfD:** 0.1 mg/kg/day

- **PEL:** Not Available

- **HA**: 0.7 mg/L (lifetime)

- **TLV**: Not Available

DISCLAIMER: The information in this profile does not in any way replace or supersede the information on the pesticide product labeling or other regulatory requirements. Please refer to the pesticide product labeling.

Appendix 2

Management of Vegetation Within Big Sagebrush Habitat Occupied by Sagebrush Dependent Wildlife (from Appendix F in PSEORMP)

Wildlife diversity and productivity is profoundly influenced by the relative abundance, structure, and spatial arrangement of sagebrush communities (refer to Chapter Wildlife and Wildlife Habitat, Figure 2-1 PSEORMP). This section describes the general values of big sagebrush types for wildlife at different canopy cover measures (Table F-1 PSEORMP), and the proportion (percent) of individual pastures and geographic areas that should support sagebrush obligate wildlife habitat (Table F-2 PSEORMP). Management of sagebrush communities that is
appropriate to soil, climate, and landform needs to incorporate the following overstory and understory components, which contribute towards healthy wildlife habitats.

Table 1—*General habitat relationships of sagebrush canopy cover (as determined by line intercept) and herbaceous understory composition to wildlife habitat values and use*

Class 1 (No sagebrush canopy cover)— Characteristic of rangelands that exhibit a grassland aspect and low vegetative structure. Generally common and widespread species of wildlife (e.g., pronghorn and horned larks) can be supported. Forage and insects are often abundant even for species that are dependent on sagebrush cover availability for nesting, hiding and so on. Class 1 rangelands do not necessarily pose a threat to wildlife diversity because they may in fact meet part or all of the habitat requirements of certain wildlife species. Native or nonnative Class 1 rangelands may be a wildlife habitat issue of concern where they dominate large tracts of land within a GMA. Depending on rangeland condition and site potential, grass and forb values are highly variable.

Class 2 (Trace to 5%)— Characteristic of rangelands that exhibit a predominantly grassland aspect and low vegetative structure. Generally common and widespread species of wildlife (e.g., pronghorn

and horned larks) can be supported. Most of the complex shrub cover needs of sage grouse and other sagebrush dependent wildlife (structure, forage, and cover) are very limited or absent altogether in Class 2 rangelands. Connelly et al. refer to the cessation of sage grouse nesting where live sagebrush canopy cover values go below 5%. Depending on rangeland condition and site potential, grass and forb values are highly variable.

Class 3 (> 5% to 15%)— Characteristic of rangelands that exhibit a shrub land aspect and desirable complex vegetative structure that is capable of supporting a variety of sagebrush-dependent wildlife (including many special status species), especially at the higher canopy values of 10 to 15%. Connelly et al. suggest that sage grouse are able to winter within habitats that support at least a 10% canopy cover of sage if the shrub cover is available 10 to 12" above snow cover. Sage grouse nesting habitat values are thought to be present at the upper (near 15%) sagebrush canopy cover values. Unpublished BLM surveys suggested sagebrush obligate songbirds began to reoccupy crested wheatgrass grasslands where the sagebrush canopy was more than 5%. Songbird studies in Nevada crested wheatgrass seedings, Macadoo (1989), showed that a balanced composition of grassland and shrub dependent species were present when shrub overstory recovery was around 10% line intercept values. Depending on rangeland condition and site potential, grass and forb values are highly variable.

Class 4 (> 15% to 25%)— Characteristic of rangelands that exhibit a shrubland aspect and desirable complex vegetative structure that is capable of supporting a wide variety of sagebrush-dependent wildlife (including many special status species). Sage grouse breeding and wintering can both occur within habitats with Class 4 shrub cover. Depending on rangeland condition and site potential, grass and forb values are highly variable.

Class 5 (> 25%)— Characteristic of rangelands that exhibit a shrubland aspect and complex vegetative structure that is capable of supporting sagebrush dependent species. Class 5 types may, though not always, support diminished herbaceous cover values. However, Class 5 cover values need to be present for some species such as the pygmy rabbit. Mule deer and elk use this type of habitat for hiding in rangelands where topographic cover is limited and/or tall structure provided by mountain shrubs is absent. Class 5 shrub cover does not necessarily imply poor or low value habitat conditions for wildlife.

Desired Amounts and Arrangements of Sagebrush Habitats

Structural characteristics and general distribution at mid scales (GMA's): Shrub cover capable of supporting the life history requirements of sage grouse and other wildlife (such as Classes 3, 4, and 5 from Table F-1) that use sagebrush habitats should be present at multiple scales, over a large area, and in a variety of spatial arrangements (such as at a landscape level and with connectivity present). This should include a central core of sagebrush habitat, which is present in large contiguous blocks as well as some other habitat arrangements such as islands, corridors, and mosaic patterns. Each of these patterns has significance to wildlife within geographic areas.

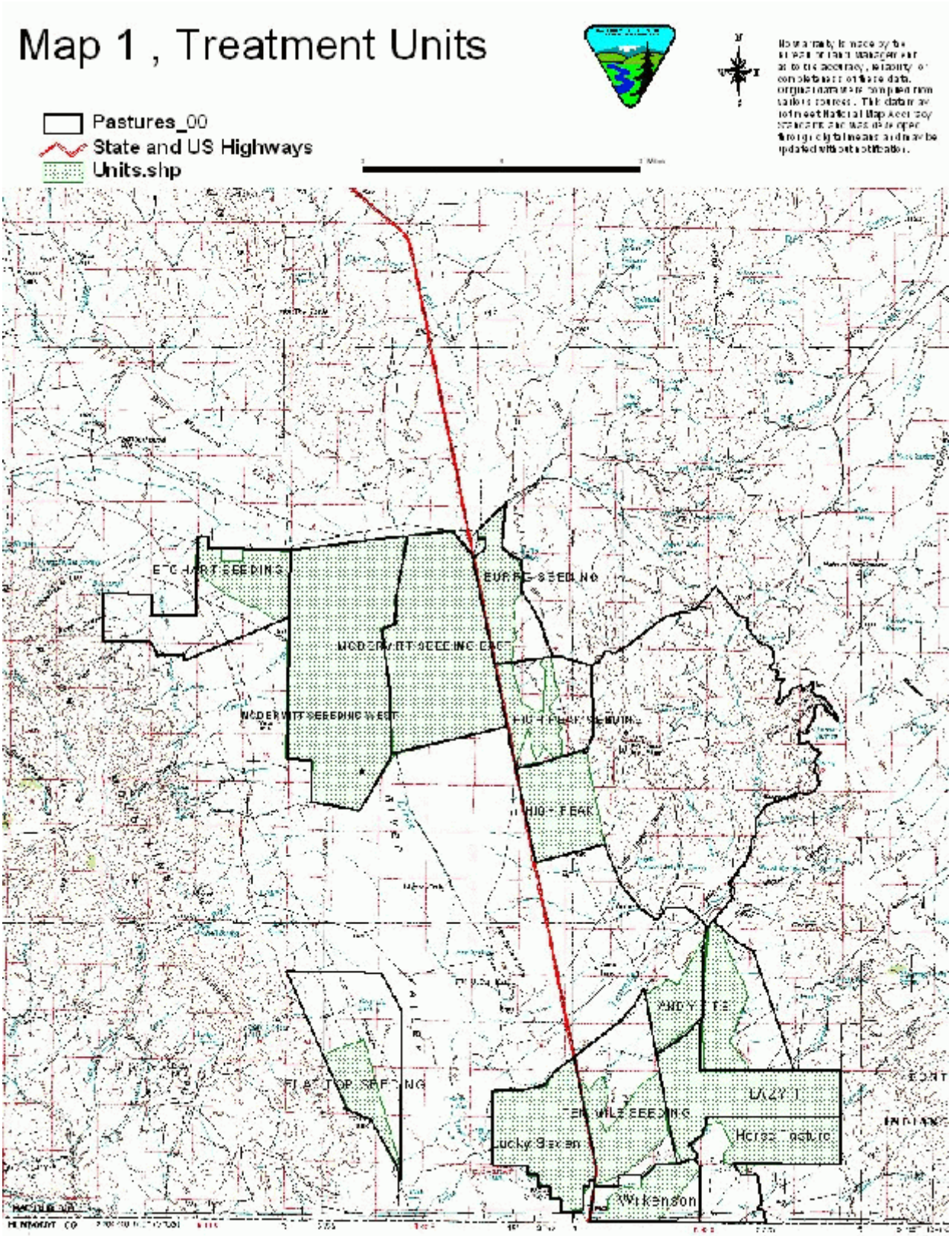
Wildlife objectives for sagebrush communities in individual pastures, allotments, and GMA's will be determined on the basis of factors such as: (1) presence of sage grouse and their seasonal life history needs, (2) existing native shrub cover patterns and characteristics within each GMA, (3) the frequency and reasonably foreseeable likelihood of fire, and (4) locations of seedings and their shrub overstory conditions. Shrub cover should be present that shows some mix of height and age classes but with an overall emphasis on the presence of communities with shrubs in a mature structural status per Thomas et al. (1984).

Big sagebrush shrub cover on native range at fine scales (pastures): Shrub overstories capable of supporting sage grouse and other species that use sagebrush habitats should be present on at least 50 to 75 percent of the surface acreage of livestock management pastures capable of supporting big sagebrush communities. For example: a 1000-acre native-range pasture that is a Wyoming, mountain, or basin sagebrush type should provide shrub cover capable of supporting sage grouse and other species that use sagebrush habitats on at least 500 to 750 acres (such as Classes 3, 4, and 5 from Table F-1).

Big sagebrush shrub cover on seeded range at fine scales (pastures): Shrub overstories capable of supporting sage grouse and other species that use sagebrush habitats should be present on at least 25 to 50 percent of the surface acreage of livestock management pastures capable of supporting a big sagebrush community. For example: a 1000-acre seeded pasture that is a Wyoming, mountain, or basin sagebrush habitat type should provide adequate shrub cover capable of supporting sage grouse and other species that use sagebrush habitats on at least 250 to 500 acres (such as Classes 3, 4, and 5 from Table F-1).

Herbaceous understory on native range at fine scales (pastures): Herbaceous understory composition throughout most native range habitats should exhibit multiple species of native forbs and grasses consistent with site potential at mid, late, or PNC seral stages.

Herbaceous understory on seeded range at fine scales (pastures): Herbaceous cover composition in seedings should support one or more adapted forb species.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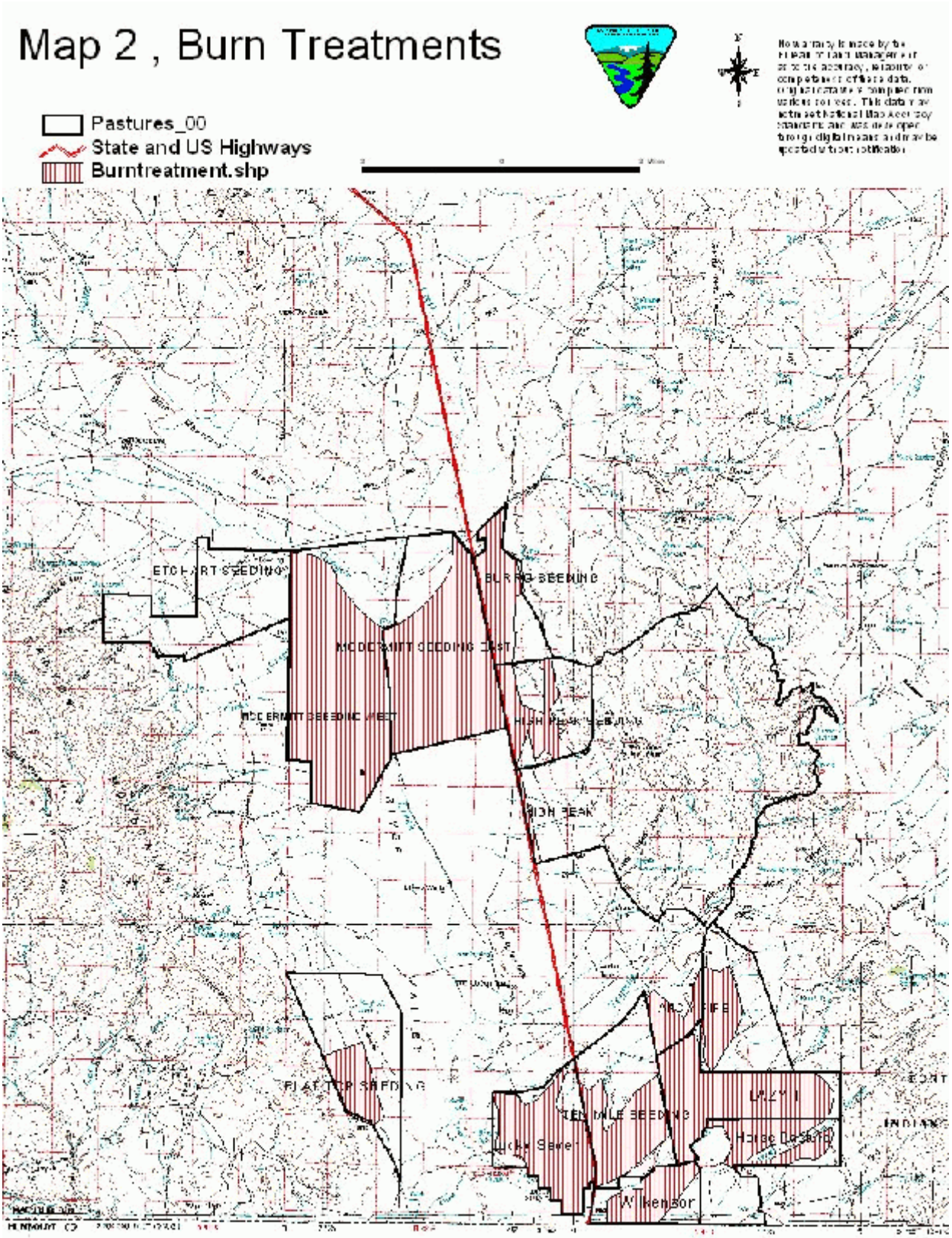
Lucky Seven
Wilkenson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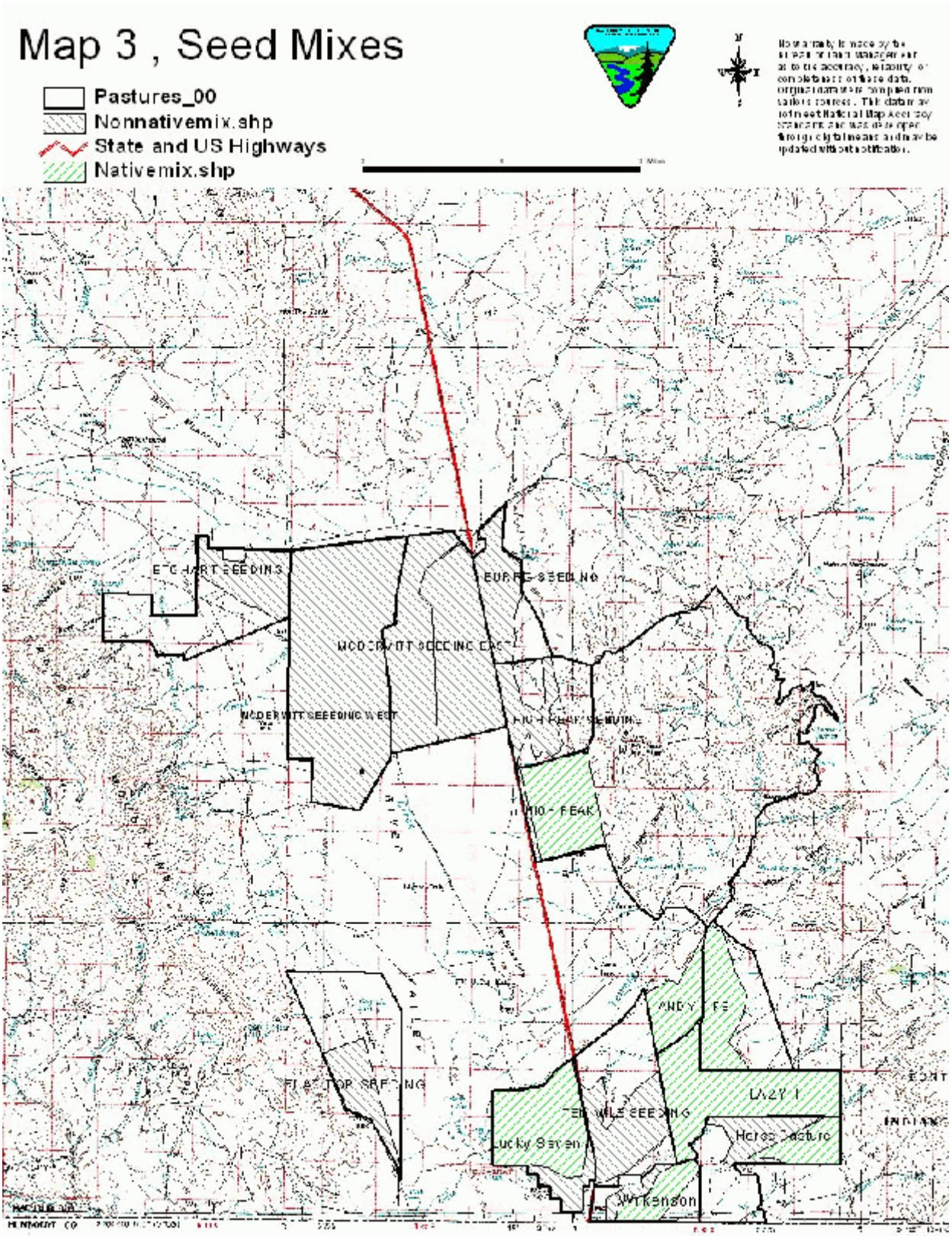
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Lucky Seven
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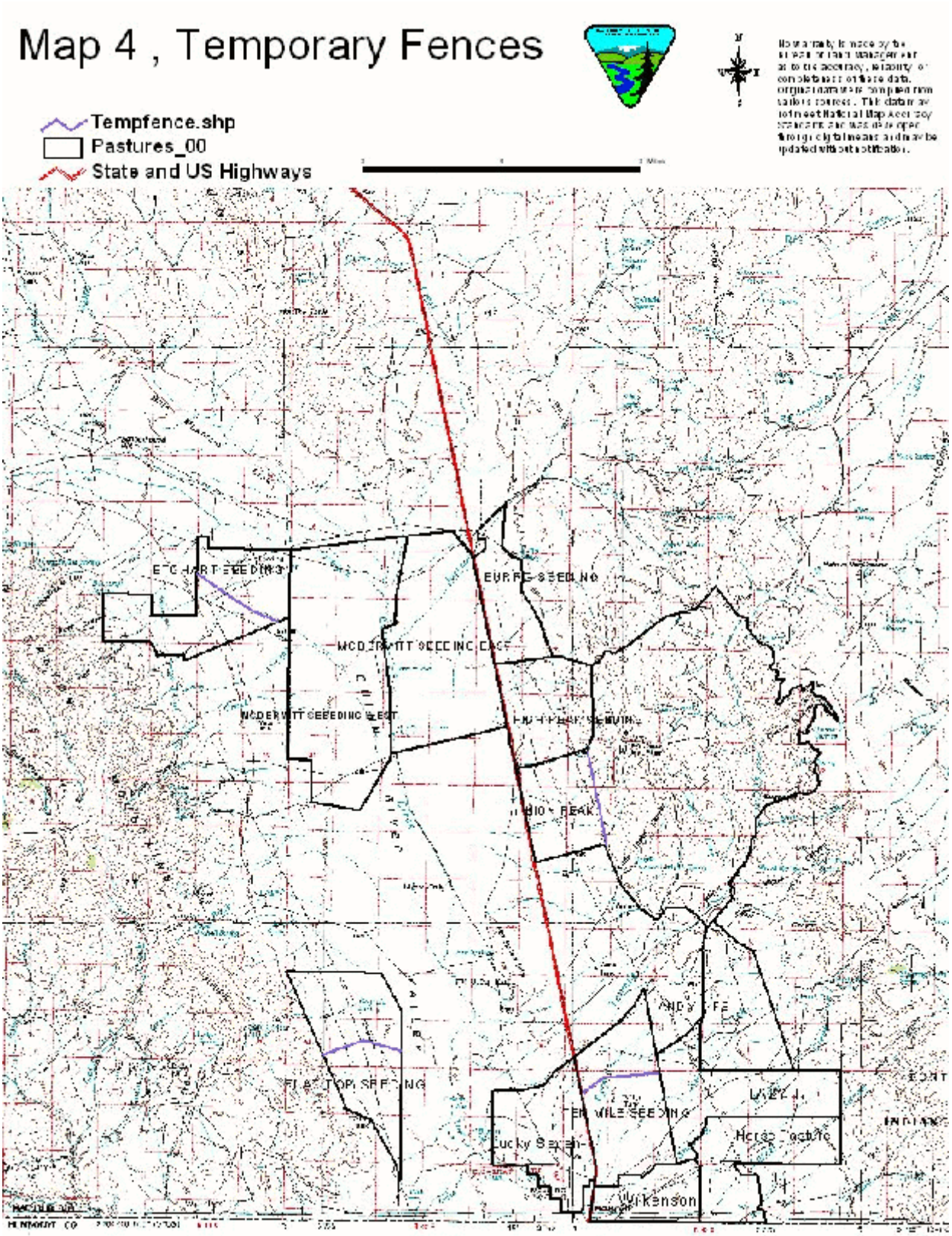
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